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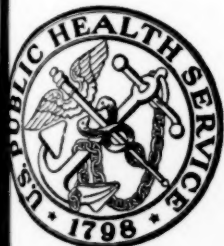
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FEDERAL SECURITY AGENCY

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Public Health Reports

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Study of the Cost of Medical Care

—A Note on Survey Methodology—

By ISIDORE ALTMAN and RUTH WADMAN*

The cost of hospitalized acute illness to patients, as compared with their incomes and benefits received from voluntary health insurance plans, concern not only those who incur the expense but also those who organize and administer medical care programs. Information on the subject is scarce, partly because of the difficulty of getting full and accurate economic data which people are sometimes unwilling to disclose. A recent study on illness costs summarizes certain basic information collected from patients and from financial records maintained by physicians and hospitals. The methods are presented below with the hope they may be of use to those who plan similar studies.

A study of the costs of hospitalized illness in the District of Columbia has recently been completed, and the principal findings have been published in the Journal of the American Medical Association (1). In the performance of the study, some survey techniques were devised; certain phases of the study which were approached with some misgivings met with unexpected success, while others did not turn out so well. Our experiences, we feel, are worth setting down in the hope that others making similar studies will find them of some help and guidance.

The study was made to obtain information on (1) the cost of hospitalized illness among nonindigent persons and its relation to family income; (2) the division of the cost among hospital, physician, and other services; and (3) the degree to which prepayment plans are helping their members meet the cost of illness that involves a stay in the hospital. The study was sponsored by the Medical Society of the District of Columbia with the cooperation of the Medico-Chirurgical Society and the 13 general and allied special hospitals in the District of Columbia which participated in the study. The field work and statistical analysis were conducted by the Division of Public Health Methods of the Public Health Service.

Data were obtained from three sources: Social and economic information about the patients was obtained from them by personal

* From the Division of Public Health Methods, Public Health Service.

contact or mailed questionnaire; hospital charges were tabulated from accounts in the hospital; and physician charges were obtained by mailed questionnaire. No patient was approached without the written permission of his physician, and no financial record in any hospital was furnished without the patient's written consent.

Preliminary Steps

Every study entails a considerable amount of spade work before the first questionnaire is mailed or the first interview obtained. In a study such as this, in addition to planning of questionnaires and tabulations, satisfactory relations have to be established with physicians and hospitals.

Here, since the study originated with the Medical Society, no particular problem of physician cooperation arose. Approval for the study was obtained at a business meeting of the Society. The study directors subsequently held two meetings with members of the Committee on Medical Care of the Society to seek advice on such questions as whether to use the fees charged by physicians or actual collections (fees were chosen, because collections might have prolonged the study interminably), and how information on these charges might most feasibly be obtained from the physicians.

Most of the hospital superintendents were visited to acquaint them with the study and obtain their cooperation. Final agreements were worked out through the Hospital Council of the National Capital Area. The Council, seeking to protect its member hospitals from possible unpleasant repercussions, stipulated that written permission of the physician was necessary to interview the patient and written permission of the patient was necessary to obtain hospital financial data.

The study was started with a letter from the Medical Society of the District of Columbia to the physicians in the area. This letter named the organizations sponsoring the study; explained the need to interview patients in order to obtain certain data essential to the study; urged the physicians to sign and return request-for-consent slips promptly when these began to arrive; and reminded them that all data given by patients, physicians, and hospitals would be entirely confidential and used for statistical purposes only. Simultaneously an announcement of the study was released to local newspapers.

Procedures

The patients in the study sample were drawn from the admissions over a 2-week period in each of the 13 participating hospitals. These periods extended through November and December 1949, except for one hospital covered in January 1950. During the 2 weeks a hospital

was being covered, a list of its nonindigent admissions for the previous day was picked up early each morning by messenger from the study office. Each physician whose name was on the list as having sent a patient into the hospital was then addressed by letter that same morning for consent to have his patient interviewed. He was asked also for blanket consent to interview any of his patients who were hospitalized in one of the 13 hospitals during the study period. This was a convenience to the physician and very definitely a major help to those making the survey.

An interview questionnaire had already been prepared (appendix A). As physician consents were received, the study office identified the individual questionnaires by entering the name of the hospital, the name of the patient, and other data from the hospital admission lists. With these questionnaires in hand, interviewers set forth to see the patients. During the 2-week period at each hospital, a messenger delivered new patients' questionnaires from the study office to the interviewer daily. Three or four hospitals were covered simultaneously until all 13 were completed, a balance being struck between large and small ones to keep the work load within control.

In November and December the admission lists picked up averaged 67 patients per day. Office staff prepared the request-consent letters and built up the necessary card files of physicians and patients. A messenger and one clerk had to be on the job week ends to keep up with the volume of letters to be issued.

A questionnaire was sent by mail to patients who had left the hospital before they could be reached by the interviewer. The form used was changed slightly from the interview questionnaire to make it simpler for the respondent himself to fill out.

About a month was allowed between the close of the interview period at a hospital and the return by statistical personnel to obtain data on the interviewed patients' hospital charges. This interval gave the hospital time to close its books on most of those patients. The hospitals, with two exceptions, preferred to assemble the financial records themselves upon receiving a list of the patients involved.

About 2 months after the interview period at a hospital, the attending physician was asked by letter to furnish the following information: the amount charged each patient; any payment to him on these fees from a medical or surgical plan; whether the patient was medical, surgical, or obstetrical; and the name of the referring physician, if any. The reply form which accompanied this letter to the 734 attending physicians in the study is shown in appendix B. Physicians named as having referred patients were then queried by mail as to their fees. There were 402 referring physicians, of whom 226 were also among the 734 attending physicians. Considerable and very effective use was made of the telephone to clear up belated replies.

For patients who were members of either of the two prepayment medical plans in the District of Columbia, data on the amount of benefits received were obtained directly from their organizations. The amount of benefits commercial policies paid was determined by telephoning or writing the patients who held them.

Comments on Methods

Probably anyone who has undertaken a new study looks back with satisfaction on the soundness of some of the methods and procedures used. About others, he wonders why pitfalls were not foreseen—why some things were done in one way when another way would have been so much better. Such was the story here.

Orientation of Interviewers

To do the interviewing, six women were selected from the staff of the Division of Public Health Methods on the basis of their experience and aptitude. Two had interviewed respondents in house-to-house surveys. A third had had interviewing experience as a medical social case worker and in medical care studies. Although the other three did not have similar types of experience, their work, one as a medical-records librarian and two as junior statisticians on health studies, provided elements useful for handling the questionnaire in this study. All six, it was believed, would have the tact required to work with busy hospital personnel and with patients.

A brief on the purpose and method of the study and a manual to guide the interviewers in the conduct of their work at the hospitals were prepared, as well as an explanation of the items on the questionnaire and instructions for filling them out. This material was carefully reviewed with the interviewers before they started at the hospitals. A meeting 3 or 4 days later would have served to pool experience and iron out the slight variations displayed by individual interviewers in their understanding of a few items on the questionnaire. But this step was not feasible because of the need to keep patient loss at a minimum by having no interruption in the work at a hospital. The situation was met by individual consultation with the interviewers after scrutiny of their first completed questionnaires.

The interviewers were familiar in a general way with the type of coverage offered by the two prepayment plans in the District of Columbia. But a discussion of the salient features of each plan and the explanatory leaflet each plan issues would have given them a more comprehensive background of information.

Introduction of Study to Hospital Personnel

To save the interviewer's time in explaining the study to the hospital personnel with whom contact would be necessary and to

obtain their cooperation most quickly, it was important that they be informed of the study by the hospital superintendent. The extent to which the several superintendents explained this study to their personnel differed widely, from no announcement at all to personal introduction of the interviewer to staff members. This method is suggested for similar studies: that the superintendent announce the study by bulletin board or other appropriate means a day or two before interviewing begins; that he provide the interviewer with a brief statement defining the study and her mission, making it clear that she has the permission of the attending physician to see the patient; and that he introduce her to necessary key persons in the hospital.

Introduction of Study to Patient

It was an unbreakable rule in this study that no patient was to be seen until the interviewer had learned, either from the charge nurse of the section or a special nurse to whom this nurse referred her, whether the patient was well enough to converse. The nurses were cooperative, and this procedure, even though it sometimes meant waiting a bit until the charge nurse was free, took less time than might be supposed.

In a hospital a patient is preeminently in a protected position. Those who come to his bedside do so to give a service or as personal visitors. The interviewer in this study came to him as a stranger and to ask a service—that he participate in a study of medical economics. In such circumstances the interviewer introduces herself to the patient and explains the study and the purpose of her visit. She needs to do this as simply and briefly as possible in order not to tire the patient and also in order to conserve time for a maximum number of interviews each day. Yet her approach to every patient must be leisurely, fresh, and unroutinized, alert to the patient's reactions and point of view.

Voluntary Participation by Patient

The patient is the one to decide whether he is willing to be interviewed. Abstracting from the interviewers' manual: "Participation in the study by the patient is entirely voluntary. The physician's consent letter is a permission to visit the patient in the interests of the study. It does not require the patient to be interviewed and is never to be interpreted as an order for that." Because it might be so construed, the interviewer was cautioned against showing it to the patient. Again from the manual: "If the patient himself should raise the question as to whether his physician approves the study, your answer obviously is that his physician is interested, cooperating, and aware that his patients are being visited. Only if it becomes

necessary to verify your statement to the patient would you use the consent letter, and that necessity is remote."

Full Cooperation by Patient

Once the patient had consented to participate, care still had to be taken to hold his cooperation throughout the interview. Amount of income was something which he might hesitate or perhaps even refuse to tell though responding to every other question. This was a crucial point since a questionnaire which lacked income data was lost to the study.

To spring a delicate question is unfair to the respondent and unproductive of his continuing cooperation. The interviewer, in her explanation of the study, had paved the way to the income question. The descriptive statement which had been prepared for her use and adaptation read: "The study will produce information on matters which are of concern to all who have had the expense of illness. Such matters, for example, as the cost of a sickness severe enough to require hospitalization and the relation of that cost to the family income; the loss of income sickness causes; the plans and means people have for meeting sickness bills."

At an appropriate point in the conversation, the interviewer made it clear that all information a patient gave on whatever topic was confidential and would be used for statistical purposes only. When the time came in the interview for the income question, she made its routine nature felt by asking it easily and naturally.

Hospital Coverage by Interviewers

At hospitals where the average number of admissions for whom consent was received was between 20 and 25 per day, the work load was heavy enough to keep one interviewer busy. If a hospital averaged fewer than 20 such patients per day, part of her time could be used elsewhere in the study; but if a hospital had between 26 to 34 per day, 34 being the highest daily average at any hospital in the study, two interviewers were needed. Week-end coverage was advisable, and in the larger hospitals it was essential, to keep current.

By and large, interviewing was done during nonvisiting hours in order not to intrude on a patient's time with family and friends. However, with patients who had a hearing or a language handicap, with child patients, and with adults who preferred to have the economic head of the household interviewed, it was necessary to see the responsible visitor. Often this entailed evening work.

Loss of Short-Term Patients

The time lag between admission of a patient and receipt of the physician's consent was a handicap. If a patient was admitted

Monday, then Thursday was the earliest the consent could be received at the study office, and Friday was the earliest day the interviewer could receive the questionnaire the office prepared. Although a majority of the physicians responded with reasonable speed, consent was received in 3 days from only 31 percent; 25 percent took 4 days; 16 percent, 5 days; and the remaining 28 percent, 6 days or more. Happily, 92 percent of the physicians gave blanket consent when they responded, thus clearing the way to all their later patients. But many of their earlier short-term patients could not be interviewed at the hospital because consent came too late.

To reduce the time lag, key physicians might have been asked for blanket consent before the interviewing period started. In most communities a number of physicians—a nucleus they might be called—have a considerable load of hospital patients. For example, in this study two physicians had 32 patients each; one had 28; two others had 23 each; another had 21; three had 20 each, and so on. It should not be difficult to discover in advance who these physicians are and, through a channel like the medical society, obtain their blanket consent in advance.

Another type of time lag proved to be an obstacle to reaching the shortest-term patients by interview. The study office received the patient's name from the hospital the day after he was admitted and, if the physician's blanket consent had already been given, prepared a questionnaire and sent it to the interviewer either late the same day or early the next. This meant that even with the physician's consent on file in advance of the patient's admission, it was the second day after his admission before the interviewer could approach him. The result was interview loss of almost all the 1-day and many of the 2-day patients.

A better method would have been to have the interviewer start at the hospital supplied with blank questionnaires and a card index of the attending physicians who had by then given blanket consent, with the study office sending her names of additional physicians day by day as new blanket consents came in. By matching against her index the names of physicians whose patients had been admitted each day, the interviewer could reach the patients more promptly. This system was tried at one of the last hospitals to be covered, where there were many very short-term admissions, and it enabled the interviewer to reach even a number of the 1-day patients.

For all hospitals in the study, only 7 percent of the 1-day patients and 13 percent of the 2-day patients were interviewed in contrast with 37 percent of the 3-day and 52 percent of the 4-day patients. By way of further contrast, 73-percent coverage was achieved among patients with a stay of 5 days or more. Fortunately, the bias against short-term patients was reduced to minor proportions by response to

the questionnaire mailed to all patients who were not reached at the hospital. The average length of stay among patients in the study (interview and mailed questionnaire) was 7.4 days, only 0.8 day more than that among all patients admitted during the study period.

The Questionnaire

On the whole, the questionnaire worked well. Although it was on hectograph paper, it stood up under handling; and the use of medium hard pencils prevented smudging. Double spacing between lines was a help to the interviewers in writing the entries at patients' bedsides. Legibility was important later in editing and coding the data.

The discussion which follows takes up the individual items which are deserving of some comment, both those that are on the present form and some that would be on it if a similar study were done again.

Year of Birth

Although the original intent was to obtain year of birth from the patient, none of the hospitals objected to supplying this information from their records; thereby obviating one question that can sometimes be more embarrassing than any other.

Admission Date, Room Number, Name of Admitting Physician

Aware that the average length of patient stay in the hospitals in this study was a matter of days, the interviewer kept her eye on the patient's admission date and endeavored to see him as soon as possible after she had been notified of the physician's consent. To avoid loss of time in going from one part of the hospital to another, the interviewer tried to see patients floor by floor and section by section and arranged her pending interview sheets according to the patients' location. For easy reference in several stages of the study, it was useful to have the name of the admitting physician at hand.

Space had not been designated on the questionnaire for the admission date, location, or physician's name. (The "Date" space was for date of interview and the "Number" space for a number indicating numerical sequence in the study.) However, all three items were needed, and the study office entered them along with the name of the hospital and of the patient when it initiated the questionnaire from data on the daily hospital lists. Properly labeled spaces should have been provided at the top of the schedule for quick reference.

Home Address and Telephone Number

Work had not progressed far before it was realized that these two pieces of information were needed on the questionnaire for identification and contact in later stages of the study. The home address was entered by the study office from the data on the daily hospital lists.

Telephone numbers were obtained later, through directories and information service, for patients with whom it was necessary to get in touch to clarify an anomaly or complete an omission in data about their illness (approximately 200 such cases), or to learn the amount of benefit payments received by those who carried commercial insurance or Blue Cross other than Group Hospitalization, Inc. (about 400 of these cases). Looking up the telephone numbers of some 600 patients delayed the editing process. In the long run, time would have been saved had numbers been obtained from hospital records available to the study staff.

Occupation and Industry

Coding these items, which in a study such as this really means grouping them into broad categories, was more difficult than getting the information. The distinction between manager and foreman, between trade and manufacturing, and so on, is often hard to make. Although there were personal misgivings in some instances, the classifications of the Bureau of the Census and of the Social Security Board (now Administration) were followed closely (2, 3).

Persons in Family

The difficulty was to define "family"—a problem not unknown to other studies, but magnified here because of the many older patients who made their homes with married sons or daughters. Here the pooling of income was made the principal criterion for determining what constituted the family composition.

Annual Family Income

The family income had to be the sum total of the incomes of all persons included in the family count. As is apparent from the questionnaire, the patient was asked to indicate into which of five brackets the family income fell. It was feared that the direct query might cause too many patients to balk.

Wives occasionally did not know the husband's income. This was best dealt with by having the interviewer ask the husband, often in the evening. Another problem was guarding against the tendency to understate income. For the interviewer even to seem to question the veracity of the respondent is out of bounds. Much depends on how able she is in communicating to him the completely confidential nature of all personal data in the study results.

Estimated Loss of Earnings From the Illness

A patient is likely to have found out from his physician how soon he can get back to work. Persons on wages or salary generally know

whether they will be carried at full pay or how much deduction will be made. When the patient cannot answer readily, the interviewer can help by listening to his description of his particular circumstances and raising an occasional question to obtain salient facts.

A perplexing situation arises when the patient is in an acute stage of a chronic illness which has caused and may still cause long unemployment. For this type of case the study should establish specific cut-off dates. The interviewer must be careful not to give the patient the impression that anyone would unsympathetically consider his total expenses as actually thus limited, and it is well not to mention dates to him if the needed information can be deduced accurately from his recital of facts.

Obstetrical cases present a special problem because, in identical circumstances, some women consider they are losing wages during pregnancy, and others do not. A reasonable definition would seem to be that if a woman has not resigned and if she fully intends to return to her job within a few weeks after the child's birth, her loss of wages shall be considered as part of the cost of sickness, but otherwise not.

Consumption of sick leave or any similar benefit was not counted. Disability or unemployment compensation was of course deducted from loss of earnings.

Medical and Hospital Bill

The original intent had been to apportion the charges in each case among the categories shown, but it was almost immediately apparent that this would not work. It would have been better to separate payment by the individual from payment by some insurance plan as two discrete subjects for analysis.

In this particular study, in which 76 percent of the patients had incomes of more than \$3,000 and 70 percent had some kind of insurance, only a negligible number indicated they would have to raise money by borrowing or by sale of personal effects. Nevertheless, the questions are important and at other times and in other circumstances might yield highly significant information.

To simplify entering, editing, and coding of data, names of the nonprofit insurance plans in the locality should be specifically named, and there should be two additional spaces labeled Blue Cross and Blue Shield, respectively, to cover patients who carry one or both from a State other than that of the study. Obviously, there are too many commercial companies selling a cash benefit type of plan to list them by name on a questionnaire of this length, and the generic heading suffices. Because of the wide range of policies now offered the public and the large number of policies held—17 percent of all the patients in this study—type and extent of coverage should be learned,

whether hospital only, physician only, hospital and physician, for loss of salary, and so on.

Illness Costs Outside of Hospital (Excluding Physician)

In this study a hospitalized illness was defined as including the month preceding and the month succeeding the period of hospitalization. For the most part, patients knew the costs which had been incurred by their illness in the past month and could closely estimate the coming month. The patient was asked to itemize the expenditures. In many cases the half line allowed was too short for the interviewer to write the items and amounts named, and she had to wedge them in as best she could. A half dozen or so short spaces labeled to cover the items most commonly expected would have been better. In this study the common items, exclusive of physician fees, were medicines, laboratory work, X-ray, domestic service, and ambulance.

This question excluded physician fees because these were obtained from the physician and not from the patient. However, it would have been advisable to ask the patient the names of physicians, if any, who had treated him in addition to the admitting physician, in order to have leads to referring physicians.

Charges for Hospital and Related Services

The individual items under this heading matched fairly well the items on the hospital bill, except for ambulance which might be considered an illness cost outside the hospital. Information on charge for ambulance was, in fact, obtained from the patient in the interview. Though charges for special nursing were not a part of the hospital record, charges for meals furnished to the nurse were, and from these the number of nursing shifts was determined. This number was then multiplied by \$10, the standard rate per nursing shift. The item of special diet could be omitted and electrocardiography put in its stead. In some hospitals, pathology is included in laboratory charges. Data on pathology charges had to be based, therefore, on the hospitals in which they could be validly determined.

ACKNOWLEDGMENTS

We are deeply grateful to the physicians and hospitals who cooperated in the study and really made it possible, and to the 1,800 patients who so willingly gave information that was after all quite private in nature. Only with the full cooperation of these groups can a study of this kind be carried out successfully.

Our special thanks go to Theodore Wiprud, Executive Director of the Medical Society of the District of Columbia, who suggested the study and fathered it to completion; to George St. J. Perrott, Chief, Division of Public Health Methods, Public Health Service, who assigned personnel to the study; to Dr. Antonio Cioeco, Chairman, Department of Biostatistics, Graduate School of Public Health, University of Pittsburgh, for helpful advice throughout the study; and to the men and women who actually did the work.

REFERENCES

- (1) Wiprud, Theodore, and Altman, Isidore: Cost of hospitalized acute illness. J.A.M.A. 144: 835-839 (1950).
- (2) U. S. Department of Labor. Dictionary of Occupational Titles. U. S. Government Printing Office, Washington, D. C., 1939.
- (3) Federal Security Agency, Social Security Board. Industrial Classification Code. Vol. I. Description of Industries. Federal Security Agency, Washington, D. C., 1942.

APPENDIX A

MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA MEDICO-CHIRURGICAL SOCIETY OF THE DISTRICT OF COLUMBIA

MEDICAL-HOSPITAL COST STUDY

This Information Is Confidential—For Statistical Purposes Only

Name	Hospital	Date	No.
Occupation and industry	Sex (M or F)	Year of birth	
Occupation and industry of household head	Job, before illness		
Persons in family : 18 years and older	Employed or seeking work (H. H.)		
Annual family income (check appropriate box) :	Under 18 years		
Under \$3,000 <input type="checkbox"/>	\$5,000-\$7,499 <input type="checkbox"/>	\$10,000 and over <input type="checkbox"/>	
\$3,000-\$4,999 <input type="checkbox"/>	\$7,500-\$9,999 <input type="checkbox"/>		
Est. loss of earnings from this illness	Medical and hospital bill paid by :		
Patient from income or savings	Medical Service of the D. C. plan		
Patient by borrowing	Other prepayment service plan		
Patient by sale of personal effect or property	Cash benefits plan		
Other individual not in family (gift)	Other (specify)		
Blue Cross			
Illness costs outside of hospital (excl. physician)			

Number of other times members of family have been hospitalized in last 12 months

Permission for the above hospital to supply information on its charges is hereby granted.

.....
Patient's signature

CHARGES FOR HOSPITAL AND RELATED SERVICES

Room and board	Anesthesia	Total
Laboratory	Pathology	
Drugs	Radiology	
Operating room	Special nursing	
Special diet	Ambulance	
Transfusions	Other (specify)	
Days in hospital	Days of special nursing	

APPENDIX B

THE MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA
MEDICO-CHIRURGICAL SOCIETY OF THE DISTRICT OF COLUMBIA

MEDICAL-HOSPITAL COSTS STUDY

This Information Is Confidential—For Statistical Purposes Only

[illegible]

*S=surgical; M=medical; O=obstetrical.

An Outbreak of Q Fever in Sokol, Yugoslavia, August 1950

By EDWARD S. MURRAY, M.D.,* PREDRAG DJAKOVIĆ, M.D.,† FRANJA LJUPŠA,†
and JOHN C. SNYDER, M.D.*

Q fever had been reported up to 1950 from Australia (1), North America (2-5), Panama (6, 7), Western Europe (8-13), the Middle East (14-16), the Mediterranean area (17-20), and South Africa (21).

With Q fever already recognized in so many countries, particularly those of the Mediterranean littoral, it would be reasonable to expect this disease to occur in Yugoslavia. While our present study was in progress, we learned that Jovanović et al. (22) had published a report on Q fever in Yugoslavia. This paper has not been available to us for review. The present paper reports the serological findings in 10 individuals from an outbreak clinically resembling Q fever which occurred in Sokol, a village in Bosnia, Yugoslavia, during August 1950.

Clinical Observations

During July and August of 1950 we were investigating fevers of unknown origin in Bosnia, Yugoslavia. At the time we were primarily interested in sporadic cases of recrudescent typhus; however, on August 11, 1950, a man, A. P., from the village of Sokol appeared in the dispensary of Dr. Djaković in Gračanica (some 6 miles from Sokol) complaining of chills, headache, and malaise of some 6 days duration. His temperature was 39.1° C. orally in the dispensary. On questioning, he stated that a large number of people in his village were similarly sick. Obviously, this illness was different from the typically sporadic cases of Brill's disease we were investigating.

On the evening of the same day we visited Sokol, high up in the hills, and found that at least a dozen people were sick in their homes, complaining of chilliness, headache, and general aching. Only one patient complained of cough; none complained of chest pain.

Six of these patients we examined and questioned fairly carefully before drawing blood. Four more patients, some of whom were ambulant, were questioned superficially before blood specimens were taken. With one exception the symptoms of individuals in this latter group were similar to those of the original five patients ques-

*Department of Microbiology, Harvard University School of Public Health, Boston, Mass. †From Gračanica and Doboj, Bosnia, Yugoslavia, respectively. This work was supported by grants from the Division of Research Grants and Fellowships of the National Institutes of Health, Public Health Service, and the Lederle Laboratories Division of the American Cyanamid Co., and was conducted with the aid of the Commission on Virus and Rickettsial Diseases, Armed Forces Epidemiological Board, Office of the Surgeon General, U. S. Army, Washington, D. C.

Table 1. *Clinical findings in 10 individuals from an outbreak of Q fever, Sokol, Yugoslavia, August 1950*

Name	Age	Sex	Symptoms and signs						Miscellaneous complaints
			Acute phase ¹ temp. C., Aug. 11, 1950	Chills	Malaise	Head- ache	Palpa- ble spleen	Rash	
B. V.-----	48	M	39.2	+	+	+	(-)	(-)	Dry cough, vertigo. Constipation.
B. H.-----	54	M	38.8	+	+	+	(-)	(-)	
A. P.-----	45	M	39.1	+	+	+	(-)	(-)	
B. Ag.-----	30	M	38.3	+	+	+	(-)	(-)	
B. Ad.-----	50	M	38.0	+	+	+	(-)	(-)	Claimed he felt better 8/10/50. Claimed he became well 8/10/50.
N. Ib.-----	46	M	37.0	+	+	+	N. T.	N. T.	
N. M. ² -----	33	M	-----	-----	-----	-----	-----	-----	
F. Hat. ³ -----	20	F	-----	-----	-----	-----	-----	-----	
F. Han. ³ -----	56	F	-----	-----	-----	-----	-----	-----	
N. Z. ³ -----	50	F	-----	-----	-----	-----	-----	-----	

¹ Temperatures axillary.

² These three patients were only briefly questioned without examination.

³ History of vague illness 2 months previously; patient not examined. N. Z., wife of N. Ib.

N. T. = Not tested.

tioned; the one exception was a woman, N. Z., who gave only a vague story of illness 2 months previously with no present complaints. The clinical data are presented in table 1.

As we left the village, at least a half dozen other people stopped us and recited symptoms similar to those of the patients in the first group we had examined. We were importuned by still others to visit their reputedly sick relatives or friends. We estimated that on August 11 about 50 persons were sick in this village of approximately 400 inhabitants. Apparently, all those who were ill were adults, with males in the majority. No certain cases of the disease in children were seen, although a thorough examination with temperature recordings was not made. The onset of illness seemed fairly well confined to the period from August 1 through August 8.

Eleven days later, on August 22, 1950, we returned to the village and took a second specimen of blood from each of the same 10 individuals. At this time all 10 were ambulant and those previously ill claimed they had recovered (though a few did complain of mild headache and/or weakness). There seemed to be no new cases and villagers stated that their sick were all now back at work in the fields.¹

Materials and Methods

The first serum specimens were taken August 11, 1950, during the first 10 days of the outbreak while most of the patients were still in the acute phase of their illness. The second set of serum specimens was taken 11 days later on August 22, at which time the outbreak had sub-

¹ Epidemiologic studies on this outbreak are being undertaken by Drs. Šimović, Gaon, Vesenjāk, et al. in Yugoslavia and will be reported in another communication.

sided, and the 10 patients being tested were apparently well or convalescent. A third, later convalescent specimen was obtained September 19, 1950, from two of the patients, B. V. and B. Ag.

Phenyl mercuric borate was added to the serum as a preservative in a final concentration of about 1/20,000. The serum was at first stored at +5° C. for about 2 weeks in Yugoslavia, then transported without refrigeration during 3 days by air from Yugoslavia to the United States; subsequently it was stored at -20° C.

In our tests serial twofold dilutions of the serum beginning with 1/10 were titrated with Q fever antigen following the method of the Army Medical Department Research and Graduate School (23). The only modification was the replacement of saline as a diluent by a magnesium buffer as described by Mayer et al. (24).

Results

Complement Fixation Titers With Q Fever Antigen

The results of the tests are summarized in table 2. Of the nine patients in the acute phase (3d to 10th day) of the disease, eight had negative titers with Q fever antigen while one had a 1/40 titer. Convalescent sera taken 11 days later showed a rise of titer in all nine cases with titers ranging from 1/20 to 1/640. Sera from two of the patients, B. V. and B. Ad., taken on the 44th and the 42d days after onset, had titers of 1/160 and 1/320, respectively.

The sera of N. Z., who had no symptoms at any time during the August epidemic but reported a vague illness two months previously, were negative in both first and second specimens. This subject was the wife of N. Ib.

Table 2. Complement fixation tests on sera from 10 individuals in an outbreak of Q fever in Sokol, Bosnia, Yugoslavia, August to September 1950

Patient	Onset of illness	Complement fixation with Q fever antigen ¹					
		1st specimen Aug. 11, 1950		2d specimen Aug. 22, 1950		3d specimen Sept. 19, 1950	
		Day of disease	Serum titer ²	Day of disease	Serum titer	Day of disease	Serum titer
B. V.	Aug. 6	5	0	16	1/20	44	1/160
B. H.	Do.	5	0	16	1/80	-----	-----
A. P.	Aug. 5	6	0	17	1/320	-----	-----
B. Ag.	Aug. 8	3	0	14	1/320	42	1/320
B. Ad.	Aug. 3	8	0	19	1/320	-----	-----
N. Ib.	Aug. 1	10	0	21	1/80	-----	-----
N. M.	Aug. 4	7	1/40	18	1/640	-----	-----
F. Hat.	Aug. 8	3	0	14	1/40	-----	-----
F. Han.	Aug. 7	4	0	15	1/320	-----	-----
N. Z. ³	?	-----	0	-----	0	-----	-----

¹ Authors are indebted to H. R. Cox, Director, Section of Viral and Rickettsial Research, Lederle Laboratories, for the Q fever antigens used in these tests. The Italian Henzerling strain was employed.

² The figure zero means that no fixation was observed at the first dilution tested which was 1/10 for all sera in this table. These tests were performed by Avis Ofstock.

³ Vague illness 2 months previously; N. Z., wife of N. Ib.

Complement Fixation Titers With Other Rickettsial Antigens

All the patients gave a history of having had epidemic louse-borne typhus fever during World War II, 1941-45, and all had low residual titers with epidemic typhus antigen. There were two individuals with epidemic titers of 1/80, three with 1/40, and five with 1/10 or 1/20. One individual had a barely detectable murine complement fixation titer of 1/10 in both acute and convalescent serum specimens, but in this case the epidemic titer was eightfold higher. All 10 individuals showed a negative ($<1/10$) complement fixation titer of antibodies with the rickettsialpox antigen in both acute and convalescent serum specimens.

Discussion

Robbins et al. (17) found that complement fixation antibodies to Q fever were usually not demonstrable during the first week of the disease. The rise usually began about the middle of the second week of illness. In the sera tested from the nine patients from the outbreak in Sokol, Yugoslavia, there was a marked rise in titer with Q fever antigens between the acute (August 11, 1950) and convalescent (August 22, 1950) phase sera; this is typical of the serological results obtained in other outbreaks of Q fever.

All 10 individuals had typhus fever during the World War II typhus epidemic in Bosnia; and all 10 showed complement fixation titers ranging from 1/10 to 1/80 with the epidemic antigen; acute and convalescent specimens from the same individual had identical titers. Studies on the long persistence of complement-fixing antibodies to epidemic typhus will be reported elsewhere (25). In any case, two facts are apparent: (a) A previous attack of epidemic typhus, as evidenced by the presence of a low residual titer of epidemic complement-fixing antibodies, did not seem to offer any protection against infection with Q fever; (b) individuals possessing a low residual titer of epidemic complement-fixing antibodies did not develop an anamnestic response of this epidemic typhus antibody when they suffered an attack of Q fever.

This evidence that immunity to epidemic typhus offers no protection against Q fever agrees with a report by Huebner et al. (26) who state that typhus vaccination in a group of laboratory workers apparently had little or no influence in protecting these individuals during an outbreak of Q fever in the National Institutes of Health laboratory outbreak in 1945-46.

The absence of any anamnestic response of typhus antibodies in these patients is in agreement with the studies of Zarafonetis (27) who found that the antibody titers of typhus-vaccinated individuals did not rise during the course of nontyphus febrile attacks.

The Sokol area of Bosnia has a high incidence of endemic syphilis,

and it is possible that some of these 10 individuals may have had syphilis. However, Strauss and Sulkin (28) studied some 1,433 serum specimens, 114 (8 percent) of which had 1/8 or higher titers with Q fever antigen and 39 of which had positive Kahn and/or Kohlmer tests. Their findings suggested no direct relationship between serum activity with antigens from syphilis and Q fever. Hence any possibility of concomitant *Treponema pallidum* infection does not appear to explain the marked rise in Q fever antibodies in this Sokol outbreak.

Summary

1. Complement fixation tests with Q fever antigen were performed on the acute and convalescent phase sera of nine individuals from an epidemic characterized by fever, headache, and malaise in the village of Sokol, Bosnia, Yugoslavia, in August, 1950. All nine individuals showed a marked rise in Q fever antibody titers in their convalescent serum specimens confirming the clinical impression that this was an outbreak of Q fever.

2. Nine individuals giving a history and serologic evidence of past infection with epidemic typhus developed what appeared to be typical Q fever. Apparently, past infection with epidemic typhus offers very little or no protection against Q fever.

3. In nine individuals with a positive history and serologic evidence of past infection with epidemic typhus, a subsequent Q fever infection caused no anamnestic rise of the residual epidemic typhus antibody titers.

REFERENCES

- (1) Derrick, E. H.: "Q" fever, a new fever entity: Clinical features, diagnosis, and laboratory investigation. *Med. J. Australia* **2**: 281-299 (1937).
- (2) Shepard, C. C., and Huebner, R. J.: Q fever in Los Angeles County. Description of some of its epidemiological features. *Am. J. Pub. Health* **38**: 781-788 (1948).
- (3) Topping, N. H., Shepard, C. C., and Irons, J. V.: Q fever in the United States. I. Epidemiologic studies of an outbreak among stock handlers and slaughterhouse workers. *J. A. M. A.* **133**: 813-815 (1947).
- (4) Shepard, C. C.: An outbreak of Q fever in a Chicago packing house. *Am. J. Hyg.* **46**: 185-192 (1947).
- (5) Goytia, R. S.: Fiebre Q en Mexico. *Rev. Med. de Mexico* **30**: No. 615 (1950).
- (6) Cheney, G., and Geib, W. A.: The identification of Q fever in Panama. *Am. J. Hyg.* **44**: 158-172 (1946).
- (7) De Rodaniche, E. C., and Rodaniche, A.: Studies on Q fever in Panama. *Am. J. Hyg.* **49**: 67-75 (1949).
- *(8) Gsell, O.: Q-fever (Queenslandfieber) in der Schweiz (endemische Pneumonien durch *Rickettsia burnetti*). *Schweiz. med. Wehnschr.* **78**: 1-8 (1948).
- *(9) Heni, E., and Germer, W. D.: Q-Fieber in Deutschland. *Deutsche med. Wehnschr.* **73**: 472-476. (1948).

- *(10) Stoker, M. G. P.: Serological evidence of Q fever in Great Britain. *Lancet* **1**: 178-179. (1949).
- *(11) de Prada, J.: La Fiebre "Q" en España. *Med. Colonial* (Madrid) **14**: 471-495 (1949).
- *(12) Bertrand-Fontaine, Schneider, J., and Rivron, J.: Premier cas de "Q Fever" (maladie de Derrick-Burnett) observé à Paris. *Bull. et mém. Soc. méd. d. hôp. de Paris* Nos. **32/33**: 1432-1437 (1949).
- *(13) Fonseca, F., Pinto, M. R., de Azevedo, J. F., and Lacerda, M. T.: Febre Q em Portugal. *História: Observações Clínicas: Diagnóstico. Clínica Contemporanea* **3**: 1159-1164; 1218-1227; 1257-1271 (1949).
- *(14) Combiesco, D., Vasiliu, V., and Dumitresco, N.: Identification d'une nouvelle rickettsiose chez l'homme en Roumanie. *Compt. rend. Soc. de biol.* **141**: 716-717 (1947).
- *(15) Payzin, S., and Golem, S. B.: Türkiye'de Q Hummasi (Rapor 1). *Türk Iji. Tec. Biyol. Der.* **8**: 94-113 (1948).
- *(16) Klopstock, A., Klopstock, E., and Rosenkranz, G.: First diagnosed outbreak of Q-fever in Israel. *Harefuah* **37**: July 1, 1949.
- (17) Robbins, F. C., Gauld, R. L., and Warner, F. B.: Q fever in the Mediterranean area: Report of its occurrence in allied troops. II. Epidemiology. *Am. J. Hyg.* **44**: 23-43 (1946).
- *(18) Caminopetros, J.: La Broneho-pneumonie Épidémique hiverno-printanière, Humaine et Animale (Chèvre, Mouton), Fièvre Q ou Grippe des Balkans, à *Rickettsia burneti* var. *caprina*, les Caractères Particuliers de l'infection Animale. *Ann. Inst. Pasteur* **77**: 750-756, (1949).
- (19) Lengrand, J.: Nouvelle Observations de Q Fever Faite dans les Environs d'Alger. *Bull. Acad. nat. méd.* **132**: 251-253 (1948).
- *(20) Blanc, G., Martin, L. A., and Maurice, A.: Le Mérion (*Mériones shawi*) de la Région de Goulmine est un Réservoir de Virus de la Q Fever Marocaine. *Compt. rend. Acad. d. sc.* **224**: 1673-1674 (1947).
- (21) Gear, J. H. S., Wolstenholme, B., and Cort, A.: Q fever: Serological evidence of the occurrence of a case in South Africa. *South Africa Med. J.* **24**: 409-411 (1950).
- (22) Jovanović, L., Kičić, M., and Radojičić, B.: Prva Epidemija Q Groznica u Jugoslaviji. *Voj. San. Pregl.* **7**: 82-93 (1950).
- (23) Plotz, H., Bennett, B. L., Wertman, K., Snyder, M. J., and Gauld, R. L.: The serological pattern in typhus fever. I. Epidemic. *Am. J. Hyg.* **47**: 150-165 (1948).
- (24) Mayer, M. M., Osler, A. G., Bier, O. G., and Heidelberger, M.: The activating effect of magnesium and other cations on the hemolytic function of complement. *J. Exper. Med.* **84**: 535-548 (1946).
- (25) Murray, E. S., Cohen, S., and Snyder, J. C.: To be published.
- (26) Huebner, R. J.: Report of an outbreak of Q fever at the National Institute of Health. II. Epidemiological features. *Am. J. Pub. Health* **37**: 431-440 (1947).
- (27) Zarafonetis, C. J.: Serologic studies in typhus-vaccinated individuals. II. The effect of non-typhus fevers on the Weil-Felix and complement-fixing antibodies. *J. Immunol.* **51**: 375-388 (1945).
- (28) Strauss, E., and Sulkin, S. E.: Studies on Q fever: Complement-fixing antibodies in meat packers at Fort Worth, Texas. *Proc. Soc. Exper. Biol. and Med.* **67**: 139-141 (1948).

*References cited from Tropical Diseases Bulletin.

Statistics on Premature Births and Neonatal Mortality

In December 1950, a joint statement entitled "Recommendations for Developing Comparable Statistics on Prematurely Born Infants and Neonatal Mortality," was issued by the following organizations: Public Health Conference on Records and Statistics; Association of Maternal and Child Health and Crippled Children Directors; Children's Bureau and the National Office of Vital Statistics of the Federal Security Agency. Since then the report has received wide circulation among many groups interested in these statistics.

An important achievement of medical science and public health measures over the past few decades has been the marked reduction in infant mortality. The advance, however, has been much greater in the group surviving the first few days of life than among the newborn, and in recent years a major portion of the infant deaths have occurred shortly after birth. The situation has focused attention on the need for intensified investigation of factors related to immaturity, the condition associated with most of the deaths in early infancy.

Practically all certificates of birth now in use in this country contain items on "birth weight" and "weeks of gestation." Combining data from matched birth and death records would provide information needed to determine the relative chances of survival in various birth-weight groups and changes in the mortality rates that occur over a period of time.

The usefulness of statistics on immature (or prematurely born) infants and neonatal mortality for national and State planning depends to a great extent on the comparability of the data collected and tabulated. Recommendations in the report cover definitions, improvement in source data, classification groups for several critical items, and derivation of statistics from matched birth and infant death certificates.

Copies of the statement can be obtained by writing to the National Office of Vital Statistics or the Children's Bureau, Washington 25, D. C.

Recommendations for tabulation of statistics on immaturity and neonatal mortality needed nationally and locally are now being drawn up by the organizations listed in the first paragraph. These will include (a) specifications for the collection by the National Office of Vital Statistics of data prepared by State offices to make available national and regional statistics and (b) suggestions for the tabulation of a minimum set of data by State offices for their own programs.

Incidence of Disease

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

Reports From States for Week Ended July 21, 1951

The number of cases of poliomyelitis increased about 30 percent, from 592 last week to 773 for the current week. For the same week last year, 802 cases were reported. The cumulative total since the seasonal low week is 3,360 and 4,535 for the calendar year. The corresponding figures for 1950 were 3,893 and 4,995, respectively. The above data exclude Missouri and Pennsylvania from which no reports were received for the current week.

The geographic regions which showed substantial increases in number of cases for the current week as compared with last week were the East South Central and the Mountain States. The total number reported in the West South Central declined from 155 last week to 148 for the current week. In this region, Texas showed a marked decrease from 92 to 66 cases, while in Louisiana there was a moderate increase from 29 to 41 cases.

New York State reported 52 cases for the current week, 17 of which were in New York City, as compared with 26 for the previous week in the State as a whole. All of the East South Central States reported increases as compared with the previous week, especially Kentucky and Mississippi. The number of cases in the Mountain States increased from 33 last week to 82 for the current reporting period, nearly all of the increase taking place in Colorado and Utah.

Dr. G. W. Cox, Texas State Health Officer, on July 19 stated that only three counties have shown an increase in incidence of poliomyelitis this year as compared with 1950. The total reported incidence on July 19 was 84 cases in Nueces County, 27 in San Patricio, and 9 in Grayson, as compared with 30, 9, and 3 cases, respectively, last year.

Dr. C. C. Kuehn, Louisiana Department of Health, on July 17 stated that 57 paralytic and 14 nonparalytic cases of poliomyelitis had been reported from Shreveport this year. Thirty-nine of the paralytic cases have been in nonwhite persons, 5 of which were under 1 year of age; 18 were in the 1-4-year age group, and 13 were 5-14 years old. Two deaths from the disease occurred in Caddo Parish.

In California, the disease has been concentrated in counties around the San Francisco Bay area and in and around Los Angeles. In Colorado, the latest report indicates a concentration in Denver and in contiguous counties. In Illinois, most of the cases have occurred in the northern part of the State. In Wisconsin, about half of the cases reported were in Milwaukee; and in Michigan, more than half have been reported from Detroit. In Massachusetts, a large proportion have been in the eastern part of the State. In Georgia and Alabama, about half of the cases have occurred in large cities.

Epidemiological Reports

Smallpox

Information regarding the case of smallpox reported last week in Kentucky has been received from Dr. Emil Kotcher, Kentucky State Department of Health. The patient was a 57-year-old farmer in Union County who had been vaccinated when a young boy but not since then. He had a history of chickenpox many years ago. No association with a recent case of smallpox could be found.

Anthrax

Dr. Kotcher reports that an epizootic of anthrax is occurring in Fulton and Hickman Counties which are in the extreme southwestern part of Kentucky. The epizootic beginning in May has affected horses, cattle, and swine in considerable numbers. Two counties in Kentucky have been quarantined and animals are being vaccinated. Thus far, no human cases have been reported. According to the Bureau of Animal Industry of the U. S. Department of Agriculture, approximately 100 animals, mostly mules, have been affected in Lake County in northwestern Tennessee. The State Department of Health also reports a small outbreak in Lauderdale County. Anthrax in animals was last reported in this region in 1947.

Infectious Hepatitis

Dr. C. R. Freeble, Ohio Department of Health, has reported a localized outbreak of infectious hepatitis in Lorain County which has been in progress since January. Dr. M. T. Fisher, County Health Commissioner, reported that 32 cases had come to his attention between January 26 and May 11. Eighteen of the cases were females and 14 were males. The youngest case was 4 years old and the oldest, 57 years, but more than half were between the ages of 5 and 15. Nineteen attended the local school. Multiple cases occurred in several families, and in one household there were six cases.

Gastroenteritis

The New York State Department of Health has reported two outbreaks of food poisoning in which ham was found to be the vehicle

of infection. One outbreak, which was investigated by Dr. C. M. Steward, occurred in the northern part of the State about the middle of June. Ten cases followed the eating of baked ham sandwiches in a local restaurant. The meat had not been kept refrigerated. The second outbreak, investigated by Dr. Dudley Hargrave, occurred June 23 in persons attending a picnic. Five to six hours after eating ham sandwiches, 23 persons became ill out of a total of 500 attending the picnic. The sandwiches had stood several hours unrefrigerated. In both instances a hemolytic staphylococcus was recovered from specimens of the meat.

Human Rabies

Dr. L. E. Burney, Indiana Commissioner of Health, has reported the first case of human rabies in Indiana in 1951. The victim was an 18-year-old girl who resided in Henry County. She was bitten in April and died of rabies in July. There have been eight laboratory-confirmed cases of animal rabies in Henry County since January 1.

Keratoconjunctivitis

Dr. H. M. Erickson, Oregon State Health Officer, has reported an outbreak of keratoconjunctivitis in Douglas County. A total of 22 cases has been found, 18 of which were in males, and 16 were of school age. Only 2 cases have been reported from the same address, but 17 were residents of Roseburg or its suburbs. The Roseburg municipal swimming pool is suspected as the source of spread for these cases.

Comparative Data For Cases of Specified Reportable Diseases: United States

[Numbers after diseases are International List numbers, 1948 revision]

Disease	Total for week ended—		5-year median 1946-50	Seasonal low week	Cumulative total since seasonal low week		5-year median 1945-46 through 1949-50	Cumulative total for calendar year—		5-year median 1946-50
	July 21, 1951	July 22, 1950			1950-51	1949-50		1951	1950	
Anthrax (062).....		1		(1)	(1)	(1)	(1)	40	27	31
Diphtheria (055).....	38	63	107	27th	78	123	194	2,086	3,251	4,806
Encephalitis, acute infectious (082).....	17	23	16	(1)	(1)	(1)	(1)	506	421	299
Influenza (480-483).....	208	196	210	30th	130,355	149,147	149,147	115,813	138,563	128,320
Measles (085).....	4,394	3,418	3,418	35th	484,135	299,082	574,526	455,434	279,952	539,597
Meningitis, meningococcal (057.0).....	64	50	53	37th	3,597	3,363	3,248	2,636	2,450	2,276
Pneumonia (490-493).....	450	662	(2)	(1)	(1)	(1)	(1)	44,066	57,772	(1)
Polioomyelitis, acute (080).....	773	826	826	11th	3,420	4,013	4,013	4,632	5,144	4,580
Rocky Mountain spotted fever (104).....	16	21	32	(1)	(1)	(1)	(1)	175	236	260
Scarlet fever (050)*.....	421	316	428	32d	168,079	55,818	79,517	52,388	39,379	56,973
Smallpox (084).....	1			35th	17	43	68	9	23	47
Tularemia (059).....	18	22	24	(1)	(1)	(1)	(1)	387	568	592
Typhoid and paratyphoid fever (040,041)*.....	71	100	100	11th	880	1,186	1,212	1,315	1,696	1,697
Whooping cough (056).....	1,249	2,468	2,245	39th	764,460	98,106	84,652	742,858	76,570	55,284

¹ Not computed. ² Data not available. ³ Deductions: Kentucky, week ended February 3, 1 case; Mississippi, week ended July 7, 1 case. ⁴ Including cases reported as streptococcal sore throat. ⁵ Deduction: Rhode Island, week ended July 14, 10 cases. ⁶ Including cases reported as salmonellosis. ⁷ Addition: Rhode Island, week ended July 14, 10 cases.

NOTE.—Data exclude figures for Missouri and Pennsylvania for week ended July 21, from which no reports were received.

Reported Cases of Selected Communicable Diseases: United States, Week Ended July 21, 1951

[Numbers under diseases are International List numbers, 1948 revision]

Area	Diphtheria (055)	Encephalitis, infectious (082)	Influenza (480-483)	Measles (085)	Meningitis, meningococcal (057.0)	Pneumonia (490-493)	Polio-myelitis (080)
United States	38	17	208	4,394	64	450	773
New England		1	1	380	3	21	30
Maine			1	41		3	2
New Hampshire				10		1	1
Vermont				7			1
Massachusetts		1		244	2		17
Rhode Island				20			
Connecticut				58	1	17	9
Middle Atlantic	2	8	2	1,184	8	44	61
New York	2	5	(1)	759	7		52
New Jersey		3	2	425	1	44	9
Pennsylvania ²							
East North Central	7			1,033	11	53	152
Ohio	2			137	5		26
Indiana				8		6	8
Illinois	2			245	4	35	52
Michigan	3			95	1	12	37
Wisconsin				548	1		29
West North Central		3	12	123	7	38	43
Minnesota				6	4	18	6
Iowa		2		35	2	2	17
Missouri ²							
North Dakota			8	33		12	1
South Dakota				8			1
Nebraska				21			9
Kansas		1	4	20	1	6	9
South Atlantic	11		79	518	15	59	72
Delaware				9			
Maryland			1	210	1	22	2
District of Columbia				8		10	
Virginia	1		74	182		20	9
West Virginia				27	2		2
North Carolina	8			25	7		4
South Carolina	2		2	13		1	4
Georgia			2	6	2	6	34
Florida				38	3		17
East South Central	4	1	4	94	9	18	106
Kentucky			1	17	1	4	12
Tennessee				28	6		21
Alabama	3			47		4	31
Mississippi	1	1	3	2	2	10	42
West South Central	9	1	27	232	5	140	148
Arkansas	2		11	21		14	20
Louisiana	1			15		18	41
Oklahoma		1	16	6	1	20	21
Texas	6			190	4	88	66
Mountain	2	2	75	255	1	35	82
Montana				51		1	1
Idaho				46			3
Wyoming				47		1	8
Colorado			7	20		7	43
New Mexico	1		1	18		16	1
Arizona	1	2	67	43	1	10	7
Utah				30			19
Nevada							
Pacific	3	1	8	575	5	42	79
Washington				42		2	5
Oregon			6	120	1	9	4
California	3	1	2	413	4	31	70
Alaska					1		4
Hawaii				64		4	

¹ New York City only.

² Reports from Missouri and Pennsylvania for week ended July 21, were not received.

Reported Cases of Selected Communicable Diseases: United States, Week Ended July 21, 1951—Continued

[Numbers under diseases are International List numbers, 1948 revision]

Area	Rocky Mountain spotted fever (104)	Scarlet fever ¹ (050)	Small-pox (084)	Tularemia (059)	Typhoid and paratyphoid fever ² (040, 041)	Whooping cough (056)	Rabies in animals
United States	16	421	1	18	71	1,249	92
New England		37			8	44	
Maine.....		6			2	24	
New Hampshire.....		1				2	
Vermont.....							
Massachusetts.....		21			5	15	
Rhode Island.....		3				1	
Connecticut.....		6			1	2	
Middle Atlantic		86			2	136	3
New York.....		78			1	71	3
New Jersey.....		8			1	65	
Pennsylvania ³							
East North Central	1	102		3	3	182	11
Ohio.....		28				35	1
Indiana.....		7				15	7
Illinois.....		19		3	2	34	1
Michigan.....	1	37			1	40	2
Wisconsin.....		11				58	
West North Central		16	1			56	10
Minnesota.....		5				1	7
Iowa.....		3				28	2
Missouri ³							
North Dakota.....						5	
South Dakota.....		1	1			1	
Nebraska.....							1
Kansas.....		7				21	
South Atlantic	12	27		1	9	178	17
Delaware.....						1	
Maryland.....	1	2			1	3	
District of Columbia.....		2			3	6	
Virginia.....	7	7		1	1	45	6
West Virginia.....		2				28	2
North Carolina.....	3	10			1	59	
South Carolina.....					1		5
Georgia.....	1				2	8	4
Florida.....		4				28	
East South Central	1	34		3	16	93	26
Kentucky.....		6			8	25	16
Tennessee.....		21		2	2	22	4
Alabama.....		4			4	24	4
Mississippi.....	1	3		1	2	22	2
West South Central		16		9	19	376	24
Arkansas.....		4		8	5	19	
Louisiana.....					2		
Oklahoma.....		4			1	34	2
Texas.....		8		1	11	323	22
Mountain	2	26		2	6	83	
Montana.....		3		1	2	5	
Idaho.....				1	4	11	
Wyoming.....	1	2				6	
Colorado.....	1	3				23	
New Mexico.....						11	
Arizona.....		4				24	
Utah.....		14				3	
Nevada.....							
Pacific		77			8	101	1
Washington.....		3			1	27	
Oregon.....		5				5	
California.....		69			7	69	1
Alaska.....							
Hawaii.....		4			4		

¹ Including cases reported as streptococcal sore throat.

² Including cases reported as salmonellosis.

³ Reports from Missouri and Pennsylvania for week ended July 21, were not received.

August 10, 1951

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FOREIGN REPORTS

CANADA

Reported Cases of Certain Diseases—Week Ended June 30, 1951

Disease	Total	New-found-land	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Brucellosis	3					3					
Chickenpox	838	8		41	2	128	459	18	24	105	53
Diphtheria	5					2			3		
Dysentery, bacillary	11					2		4			5
Encephalitis, infectious	2					1			1		
German measles	219			8		3	88		8	41	71
Influenza	8			5	1						2
Measles	908	11		30	11	148	177	27	14	349	141
Meningitis, meningococcal	7					6	1				
Mumps	316	6		5	2	48	110	17	17	53	58
Poliomyelitis	13						11			1	1
Scarlet fever	262				1	81	41	39	23	32	45
Tuberculosis (all forms)	289	20		2	17	105	34	19	5	55	32
Typhoid and paratyphoid fever	31					10	1		5		15
Veneral diseases:											
Gonorrhea	232	2		5	12	65	49	33	22	44	
Syphilis	65			2	2	40	8		8	5	
Primary	10					8			2		
Secondary	5					3	1		1		
Other	50			2	2	29	7		5	5	
Whooping cough	104			2	2	22	38	6	3	17	14

CUBA

Reported Cases of Certain Diseases—5 Weeks Ended June 30, 1951

Disease	Total	Pinar Del Rio	Habana		Matanzas	Santa Clara	Camaguey	Oriente
			Habana City	Total				
Brucellosis	1			1				
Cancer	110	3		14	26	39	12	16
Chickenpox	25		10	13	5		6	1
Diphtheria	10		4	4	3	2		1
Leprosy	39			6	1	14	3	15
Malaria	22	2	1	1		1	1	17
Measles	32		13	16	1	1	12	2
Poliomyelitis	1							1
Tuberculosis	154	4		25	14	55	41	15
Typhoid fever	77	8	14	23	7	25	6	8
Whooping cough	3						3	
Yaws	2							2

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

The following reports include only items of unusual incidence or special interest and the occurrence of these diseases, except yellow fever, in localities which had not recently reported cases. All reports of yellow fever are published currently. A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

Burma. There were only three cases of cholera reported in Mergui for the week ended July 14, 1951. For the previous 2 weeks a flare up of 18 and 21 cases was reported after a decrease of several weeks from the recent outbreak in May. One case of cholera was reported in Kyaukpyu for the week ended July 14.

Pakistan. During the week ended July 7, 1951, three cases of cholera were reported in Chittagong. For the week ended June 16, 109 cases (71 deaths) were reported in East Bengal Province.

Plague

Peru. Three cases (two deaths) of plague were reported in Cajamarca Department, Chota Province, during May 1951.

Smallpox

French West Africa. During the period June 21-30, 1951, 86 cases of smallpox were reported in Sudan and 43 cases were reported in Niger Territory.

India. During the week ended July 14, 1951, 21 and 9 cases of smallpox, respectively, were reported in the ports of Madras and Calcutta.

India (French). For the week ended June 30, 1951, Karikal reported 22 cases of smallpox and Mahe reported 3.

Typhus Fever

Morocco (French). For the period June 21-30, 1951, six cases of typhus fever were reported. These were the first cases since March when one case was reported.

1951 Census of Public Health Nurses

A gain of 5,000 public health nurses in the last 5 years, bringing the total to more than 25,000 nurses employed in public health work, is noted in the 1951 Census of Public Health Nurses, just issued by the Public Health Service.

Another important trend revealed by the census is that more nurses are better prepared for their work today than ever before. The new census gives breakdowns on educational qualifications and data on special consultants and other groups. It also indicates that 20 States and Territories now have public health nursing services in all their counties.

Copies of the 1951 census are available without charge at the Division of Public Health Nursing, Public Health Service.

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The printing of this publication has been approved by the Director of the Bureau of the Budget (August 10, 1949).

The **PUBLIC HEALTH REPORTS**, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42, sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the incidence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The **PUBLIC HEALTH REPORTS** is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the **PUBLIC HEALTH REPORTS**, reprints, or supplements should be addressed to the Surgeon General, Public Health Service, Washington 25, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington 25, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

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